

REMARKS

Claims 1-17 are pending in the application.

Claims 18-20 are objected to.

Claim 20 has been amended.

I. Abstract and Drawings

The abstract is objected to because legal phraseology such as “comprises” and undefined acronym “FIR” are used. Also, a typographical error, i.e., a second period, appeared in the abstract. Applicants have replaced “comprises” with “including” and added a definition prior to the term “FIR”. In addition, the extra period is removed.

The drawings are objected to under 37 CFR 1.83(a) as the Office Action contends that the detail features of apparatus claims 7-10 were not shown in the drawings. Please refer to Fig. 5 as well as the corresponding description from page 23, line 18 to page 24, line 23. It is respectfully submitted that the detailed features of claims 7-10, for example, can be implemented as the multiple decorrelation routine 524 that is stored in memory 522 and executed by the CPU 514 to process the signal from the signal source 526. Also, an embodiment for implementing the decorrelation routine is shown in the flow chart in Fig. 2 and the corresponding description. Furthermore, the specification states:

Although a general purpose computer system is illustratively shown as a platform for implementing the invention, those skilled in the art will realize that the invention can also be implemented in hardware as an application specific integrated circuit (ASIC), a digital signal processing (DSP) integrated circuit, or other hardware device or devices. As such, the invention may be implemented in software, hardware, or a combination of software and hardware.

Page 24, lines 18-24.

Therefore, withdrawal of these rejections is requested.

II. 35 U.S.C. § 101

The Office Action rejected claims 1-6 under 35 U.S.C. § 101, stating that the claimed invention is directed to non-statutory subject matter. Specifically, the Office Action states that the method could be practiced mentally in conjunction with pencil and paper, and further states that the method does not include either a step that results in physical transformation outside the computer, a limitation to a practical application or specific machine elements. at 3.

An analysis of claim 1 and its dependent claims demonstrates that the claim is drawn to statutory subject matter. Specifically, claim 1 recites a method for separating a plurality of mixed signals into a plurality of component signals. “Signals” are real world entities, and a method for separating mixed signals into component signals has real world application, and constitutes a physical transformation of the signal. Both of these aspects are recited in the claim. Step (a) operates on “input segments” of the “mixed signals” that undergo the recited “separating” method. An FIR filter is developed using recited steps (a) through (c) and the “mixed signals” are filtered with the FIR filter in step (d). The result of this “filtering” of “mixed signals” is to “separate” the “mixed signals” into “component signals” in step (d). Thus, the method provides both a physical transformation of the mixed signals into separated component signals, and is limited to the practical application of separating the mixed signals into component signals, thereby satisfying the stated criteria for statutory subject matter.

Also, the Office Action does not establish that the method can be practiced with pencil and paper. For example, step (d), filtering the mixed signals using the FIR filter, is not shown as being done mentally in conjunction with paper and pencil. To the contrary, as discussed above, the method is limited to the actual separation of real world signals. Thus, if the rejection is

maintained, applicants request explication of how the steps can be carried out with pencil and paper.

III. 35 U.S.C. § 112

Claims 7-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Office Action states that “The claim language is vague and indefinite. In the specification, page 6, lines 9-12, applicants disclose ‘[g]enerally, either embodiment of the invention may be implemented as a software routine that is stored in a storage medium and executed on a general purpose computer system. However, a hardware implementation is readily apparent from the following detailed description’; however, applicant do not specifically detail the specific elements as claimed in claims 7-14.” At 3.

Claim 7 recites an apparatus where one or more limitations are drafted reciting a “means” such as a “means for producing a plurality of discrete Fourier transform (DFT) values...” Applicants understand the rejection to seek clarification as to where the written description supports the recited elements. Generally, as cited by the examiner, the written description states that the separation of mixed signals into component signals can be carried out by a processor executing software. Page 24, 14-16. Thus, although not limited to only such apparatus, the written description adequately provides support for the recited claim elements.

More particularly, regarding claim 7, please refer to Fig. 5 as well as the corresponding description from page 23, line 18 to page 24, line 23. Fig. 5 describes a system for implementing the separation method of the invention. The system comprises a mixed signal source 526, a computer system 508 that executes the multiple decorrelation routine 524 of the present invention to

process the signal from the signal source 526. Fig. 1 and Fig. 2 describe the off-line and on-line multiple decorrelation routine, respectively. In regard to claim 8, please refer to page 12, lines 12-20 and page 15, line 17 to page 16, line 3. These portions of the specification describe that the filter coefficients can be transformed from the frequency domain into the time domain or vice versa. Claim 9 recites that the apparatus of claim 8 wherein said first transformer uses an inverse Fourier transformer and said second transformer uses a Fourier transformer. Page 12, lines 12-18 describes that an FFT is used to convert the values of $W(v)$ to the time and an inverse FFT is used to convert the time domain values to the frequency domain.

Claim 10 recites that the apparatus of claim 7 wherein the cost-function minimization processor carries out a gradient descent process. This feature can be supported by the specification, on page 14, lines 11-13, which states that “the gradient descent algorithm operates to minimize a cost function defined in terms of the separation filters.” In regard to claim 11, explanation for the adaptation of update step sizes based on a normalization factor, for example, can be found on page 21, lines 6-12. Claim 12 itself clearly explains various parameters of the equation. The explanation for claim 13 can be found on page 23, lines 3-9. With respect to claim 14, the specification, on page 25, lines 1-4, discusses a speech recognition processor 518 for processing the component signals.

VI. Double Patenting

The Office Action rejects claims 1 -3, 7-10 and 14-17 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2, 5-7, 9 and 12-13 of U.S. Patent No. 6,167,417. The Office Action states that “Although the conflicting claims are not

identical, they are not patentably distinct from each other.” Enclosed herewith is a Terminal Disclaimer. Applicants request withdrawal of the obviousness-type double patenting rejection.

V. Allowed Claims

Claims 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants thank the Examiner for the indication of allowance for these claims. However, applicants, at this stage, decline to rewrite these claims into an independent form. Claims 18-20 are believed to be patentable by their dependence on claim 15. Applicants reserve the right to rewrite the claims in independent form.

VI. Summary

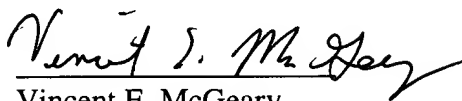
Having fully addressed the Examiner’s objections and rejections, it is believed that in view of the preceding remarks, this entire application stands in a condition for allowance. If, however, the Examiner is of the opinion that such action cannot be taken, he is invited to contact the applicants’ attorney at the number and address below in order that any outstanding issues may be resolved without the necessity of issuing a further Action. An early and favorable response is earnestly solicited.

Please address all future correspondence to Intellectual Property Docket Administrator, Gibbons, Del Deo, Dolan, Griffinger & Vecchione, One Riverfront Plaza, Newark, NJ 07102-5496. Telephone calls should be made to Vincent E. McGeary at (973) 596-4837 or (973) 596-4500.

VII. Fees

If any additional fees are due in respect to this amendment, please also charge them to
Deposit Account No. 03-3839.

Respectfully submitted,



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